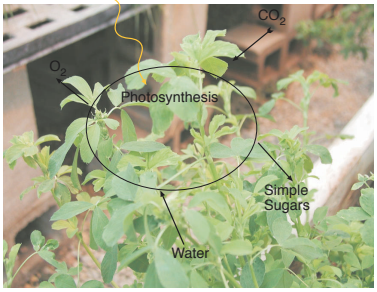
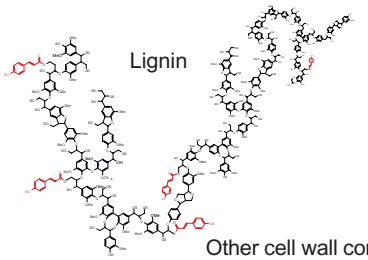
What is fiber, what is it made of and how do dairy cows use it?

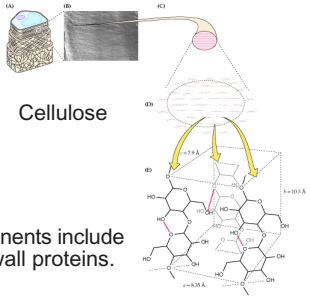


Plants are unique in that they can convert carbon dioxide and water into sugars using the sun s energy. These sugars are the raw materials for making proteins, complex carbohydrates, fats, oils, vitamins and phenolic compounds.

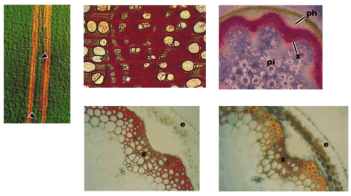
Fiber is the portion of the forage that is made up of cell walls. It gives the plant a semi-rigid structure. Cell walls are complex composites of structural carbohydrates, proteins, lignin, and phenolics.

Two major cell wall components





Other cell wall components include pectins, xylans and wall proteins.



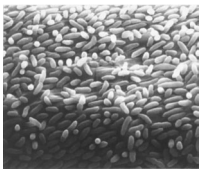
Cross-section of cell walls

Through chewing and rumination cows break forages into a soluble (cell contents) and an insoluble fraction (cell wall).

The cell wall fraction cannot be digested directly by the animal. It must be broken down by mioorganisms found in the rumen.

The cell contents, simple sugars, starch, and proteins are readily digested and converted to energy for growth, milk productution, and body maintenance.

Only the carbohydrate and protein components of the cell wall can be broken down in the rumen and converted to molecules that can be utilized by the animal.



Rumen bugs

Although fiber has limited digestibility it cannot be removed fom the cow s diet. It is critical for proper rumen function and animal health. To improve forage utilization requires that we increase the digestibility of the cell wall fraction.